

4.5 Slope-Point Equation of a Linear Function

Today's Outcome: Use the slope and one point on a line or use two points on a line to write the linear equation and draw its graph.

The “slope-point” form of the equation of a straight line is :

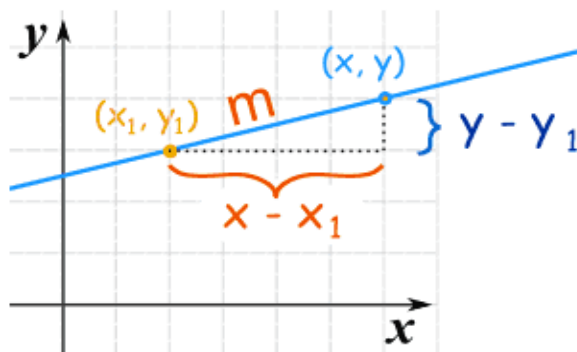
$$y - y_1 = m(x - x_1)$$

- (x_1, y_1) is a **known** point
- m is the **slope** of the line
- (x, y) is any other point on the line

When to use Slope-Point equation

This form is used when you know the slope of a line and a point on the line (that is not the y - int.) or when you know two points on a line.

$$\text{Slope } m = \frac{\text{change in } y}{\text{change in } x} = \frac{y - y_1}{x - x_1}$$



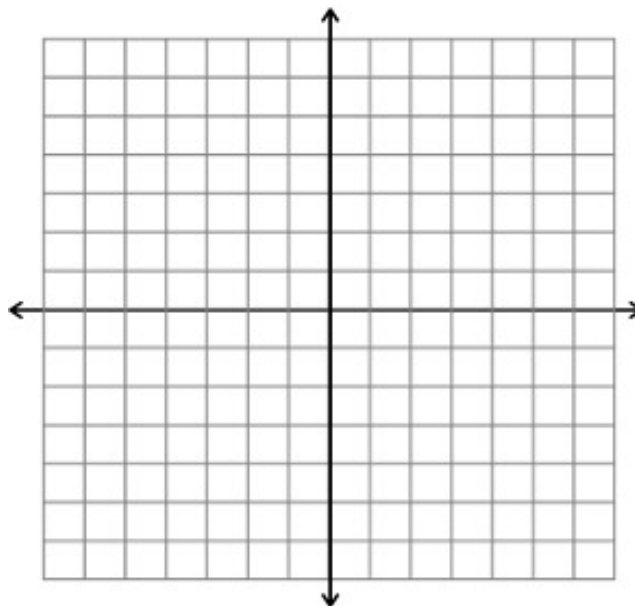
$$\frac{y - y_1}{x - x_1} = m$$

$$\frac{y - y_1}{x - x_1} = m(x - x_1)$$

$$y - y_1 = m(x - x_1)$$

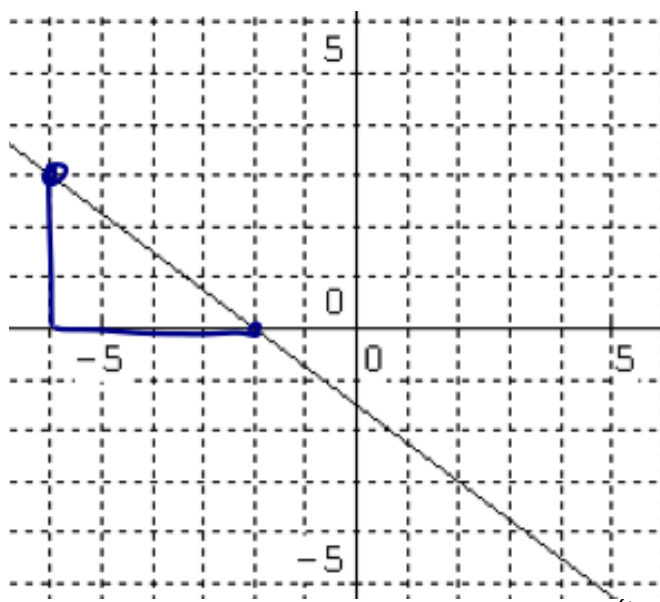
Examples

1) Determine the equation of the line with slope $\frac{1}{2}$ that passes through the point $(2, -5)$. Then graph it!



2) Determine the equation of the line that passes through the points $Q(3, 6)$ and $R(-1, 2)$.

3) Determine the equation of the following line.



Desmos-Point Slope Form

1. a) Describe the graph of the linear function with this equation:

$$y + 1 = -\frac{1}{2}(x - 2)$$

- b) Graph the equation.

2. a) Describe the graph of the linear function with this equation:

$$y + 4 = -2(x + 3)$$

- b) Graph this equation

- c) What is another point on the line?

Assignment 6.5

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